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Two new species of Lecithoceridae (Lepidoptera, Gelechioidea), with a revised check list of the family in Taiwan

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Abstract

Two species of Lecithoceridae (Lepidoptera, Gelechioidea), *Caveana senuri* **sp. n.** and *Lecithocera dondavisi* **sp. n.**, are described from Taiwan. The monotypic *Caveana* Park was described from Thailand, based on *C. diemseoki* Park, 2011. *Lecithocera* Herrich-Schäffer, 1853 is the most diverse genus of the family, comprising more than 300 species worldwide. *L. dondavisi* **sp. n.** is the largest species of the genus so far, and closely resembles the Indian species, *L. praeses* Meyrick, 1919. A revised check list of the family in Taiwan is provided.

Keywords

Caveana, *Lecithocera,* Lepidoptera, Lecithoceridae, new species, Taiwan, taxonomy

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Introduction

The family Lecithoceridae (Lepidoptera, Gelechioidea) is a relatively poorly known group of microlepidoptera that comprises more than 1,200 extant known species worldwide (van Nieukerken et al. 2011). The group has not been well studied, due to the lack of specialists and the relative unattractiveness of the moths due to the larval feeding habitat on debris and being economically irrelevant. The known species of Lecithoceridae are mostly restricted to the Oriental and Australian regions, but the distributional range includes the southern part of the Palaearctic Region.

In Taiwan, a total of 63 species of Lecithoceridae have been reported (Park 2000a; Park and Wang 2000; Park 2003a, b), with 30 species known as endemic. *Lecithocera* Herrich-Schäffer, 1853 is the most diverse genus of the family with more than 300 species described worldwide, and it is highly diverse in the Oriental Region. The genus is characterized by the presence of M_2 in the hindwing, the abdomen without spinose zones on tergites, with a bundle of long coremata in abdominal segment VII, and the male genitalia with well-developed costal bar. *Lecithocera* in Taiwan was first reviewed by Park (1999), reporting 22 species with 13 new described species. Park and Wang (2000) and Heppner (2012) enumerated 25 species, including an erroneously cited *L. theconoma* Meyrick, 1926 (this species was described from Sarawak). In this paper, *L. dondavisi* Park, sp. n. , the largest species of *Lecithocera,* is described.

The monotypic *Caveana* Park, 2010 was described from Thailand, based on *C. diemseoki* Park, 2010. The genus is placed in the subfamily Torodorinae because it shares the presence of spinose zones on the abdominal tergites and the male genitalia lacks costal bars that connects the tegumen and valva. The genus is allied to *Nosphistica* Meyrick, 1911 and *Philoptilia* Meyrick, 1918 by having a similar the venation, with M_3, CuA_1 and CuA_2 on a common stalk in the forewing and M_2 absent from the hindwing, but *Caveana* differs from them by the brightly colored forewing and the lack of rough scale projections of the hindwing costa and strongly sinuate termen. *Philoptilia* is distinguished by the forewing R_5, which is absent in *Nosphistica*. Park (2010) noted that *Caveana* has a unique concave region beyond the middle of R_2 on the ventral forewing surface. While *C. senuri* has no such concavity in the forewing, this species is still placed in *Caveana*, because of its brightly colored forewing and the male genitalia which are similar to those of *C. diemseoki. Caveana* is reported for the first time from Taiwan, describing *C. senuri* Park, sp. n. in this paper.

A revised check list of the family Lecithoceridae in Taiwan, with 74 known species, is provided in Table 1.

Table 1. Check list of Lecithoceridae in Taiwan

Species	Type locality	Type depository
Homaloxestis Meyrick, 1910		
baibaraensis Park, 1999	Taiwan	USNM
cholopis (Meyrick, 1906) (*Lecithocera*)	Myanmar	BMNH
hilaris Gozmány, 1978	Zhejiang, China	ZFMK
myeloxesta Meyrick, 1932	Taiwan	BMNH

Species	Type locality	Type depository
Lecithocera Herrich-Schäffer, 1853		
angustiella Park, 1999	Taiwan	KNA
altusana Park, 1999	Taiwan	KNA
atricastana Park, 1999	Taiwan	USNM
aulias Meyrick, 1910	Khasi Hills, India	BMNH
bimaculata Park, 1999	Taiwan	BMNH
chartaca Wu & Liu, 1993	Jiangxi, China	IZAS
dondavisi Park, sp. n.	Taiwan	MCUF
erecta Meyrick, 1935	Zheijang, China	BMNH
fascicula Park, 1999	Taiwan	KNA
fascinatrix Meyrick, 1935	Taiwan	BMNH
fuscosa Park, 1999	Taiwan	KNA
glabrata (Wu & Liu, 1992) (*Quassitagma*)	Jiangxi, China	IZAS
indigens (Meyrick, 1914) (*Frisilia*)	Taiwan	DEI
latiola Park, 1999	Taiwan	KNA
megalopis Meyrick, 1916	Philippines	BMNH
metacausta Meyrick, 1910	Khasi Hills, India	BMNH
palingensis Park, 1999	Taiwan	KNA
paralevirota Park, 1999	Taiwan	USNM
pelomorpha Meyrick, 1931	Sichuan, China	BMNH
pulchella Park, 1999	Taiwan	KNA
rotundata Gozmány, 1978	Zhejiang, China	ZFMK
serena Gozmány, 1978 (*Sarisophora*)	Shaanxi, China	ZFMK
shanpinensis Park, 1999	Taiwan	KNA
thaiheisana Park, 1999	Taiwan	USNM
tienchiensis Park, 1999	Taiwan	KNA
Lecitholaxa Gozmány, 1978		
thiodora (Meyrick, 1914) (*Lecithocera*)	Taiwan	HNHM
Frisilia Walker, 1864		
chinensis Gozmány, 1978	Sichuan, China	BMNH
cornualis Park, 2008	Taiwan, Vietnam	KNA
homalistis Meyrick, 1935	Taiwan	BMNH
Spatulignatha Gozmány, 1978		
idiogena Wu, 1994	Fujian, China	IZAS
olaxana W, 1994	Zhejiang, China	IZAS
Synersaga Gozmány, 1978		
bleszynskii (Gozmány, 1978) *(Anaminmnesis)*	Zhejiang, China	ZFMK
caradjai Gozmány, 1978	Taiwan	MGAB
Carodista Meyrick, 1925		
cultrata Park, 2000	Taiwan	MCUF
montana Park, 2000	Taiwan	KNA
notolychna (Meyrick, 1936) (*Homaloxestis*)	Taiwan	BMNH
Dinochares Meyrick, 1925		
notolepis Park, 2000	Taiwan	USNM
Issikiopteryx Moriuti, 1973		
zonophaera (Meyrick, 1935) (*Olbothrepta*)	Zhejiang, China	BMNH
taipingensis Park, 2003	Taiwan	KNA

Species	Type locality	Type depository
Tisis Walker, 1864		
mesozosta Meyrick, 1914	Taiwan	DEI
Nosphistica Meyrick, 1911		
bisinuata Park, 2002	Taiwan	KNA
fenestrata (Gozmány, 1978) (*Philoptila*)	Fujian, China	HMNH
fuscolepis Park, 2002	Taiwan	USNM
parameocola (Wu, 1996) *(Athymoris)*	Hainan, China	IZAS
tarokoensis Park, 2002	Taiwan	KNA
Subfamily TORODORINAE		
Torodora Meyrick, 1894		
albicruris Park & Heppner, 2000	Taiwan	USNM
capillaries Park& Heppner, 2000	Taiwan	USNM
chianensis Park, 2003	Taiwan	USNM
manoconta Wu & Liu, 1994	Jiangxi, China	IZAS
octavana (Meyrick, 1911) (*Brachmia*)	Khasi Hills, India	BMNH
parthenopis (Meyrick, 1932) (*Lecithocera*)	Taiwan	BMNH
pseudogalera Park, 2003	Taiwan	USNM
rectilinea Park, 2003	Taiwan	MNHU
sciadosa Wu & Liu, 1994	Sichuan, China	IZAS
ortilege (Meyrick, 1911)	Khasi Hills, India	BMNH
Deltoplastis Meyrick, 1925		
commatopa Meyrick, 1932	Taiwan	BMNH
lobigera Gozmany, 1978	Zhejiang, China	ZFMK
ovatella Park, 2001	Taiwan	MCUF
Thubana Walker, 1864		
albisignis (Meyrick, 1914) (*Lecithocera*)	Taiwan	DEI
deltaspis Meyrick, 1935	Taiwan	BMNH
Caveana Park, 2010		
senuri Park, sp. n.	Taiwan	MCFU
Athymoris Meyrick, 1935		
aurantiella Park, 2000	Taiwan	MCUF
liukueiensis Park, 2000	Taiwan	MCUF
martialis Meyrick, 1935	Taiwan	BMNH
phreatosa (Wu, 1994)	Sichuan, China	IZAS
subtrigona Park, 2000	Taiwan	MCFU
Halolaguna Gozmány, 1978		
oncopteryx (Wu, 1994)	Sichuan, China	IZAS
palinensis Park, 2000	Taiwan	KNA
sublaxata Gozmány, 1978	Kiangsu, China	HNMH
Philharmonia Gozmány, 1978		
adusta Park 2000	Taiwan	MCFU

BMNH- The Natural History Museum, London, UK; HMNH- Hungarian Museum of Natural History, Budapest, Hungary; IZAS- Institute of Zoology, Academia Sinica, Beijing, China; DEI- Deutsches Entomologisches Institut, Eberswald, Germany; KNA- Korea national Arboretum, Pocheon, Korea; MCUF- McGuire Center for Lepidoptera and Biodiversity, University of Florida, Gainesville, USA; MNHU- Museum für Naturkunde, Zentralinstitu Hummboldt-Universität, Berlin, Germany; USNM- U. S. National Museum of Natural History, Washington, USA.

Material and methods

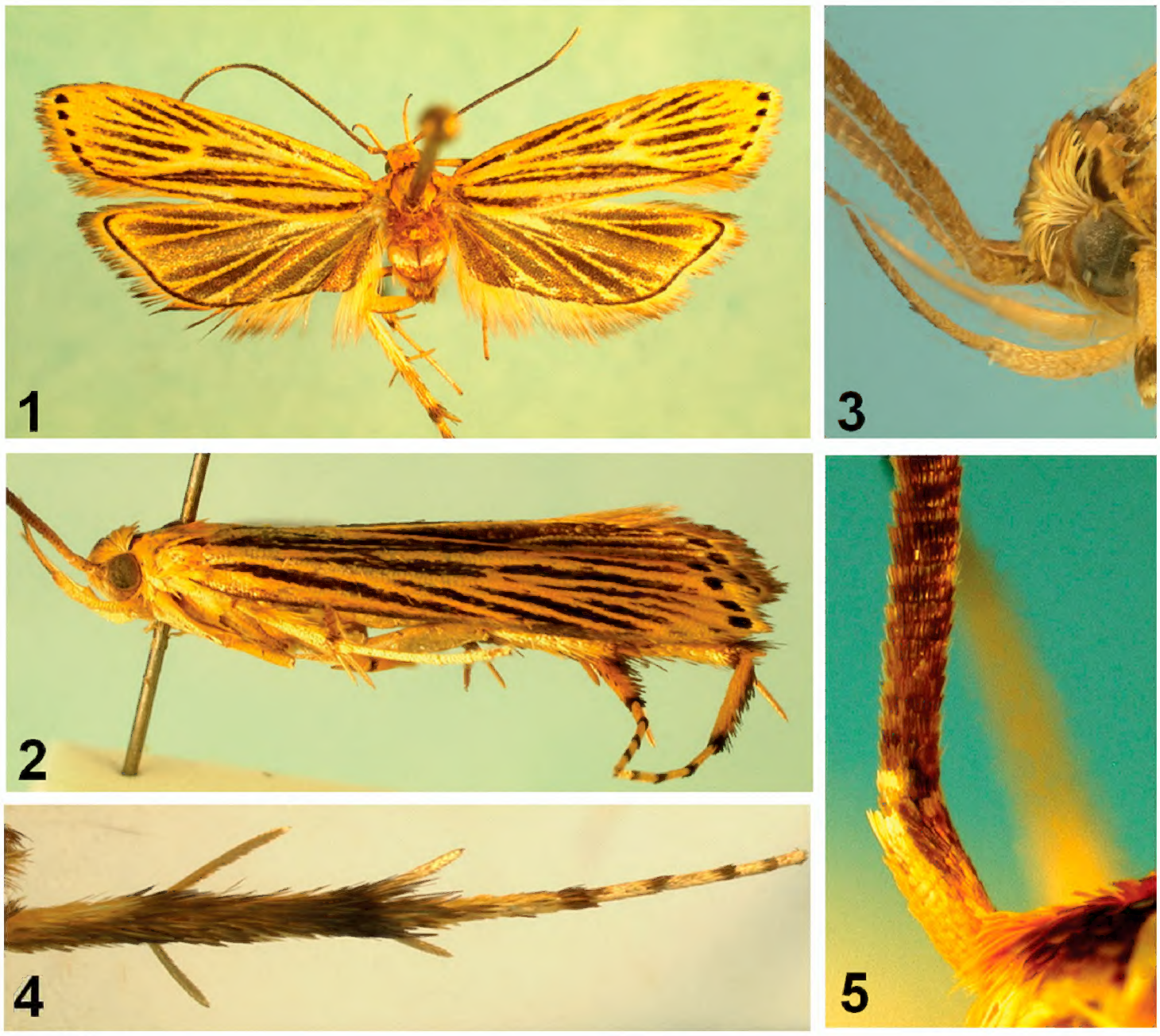
Most specimens examined were collected in 1980 and 1989 by the second author and H. Wang, researcher in the National Taiwan Museum, Taipei, Taiwan, and Donald R. Davis, US National Museum of Natural History, Smithsonian Institution (USNM), Washington D.C., USA. The material is preserved in the collections of USNM and the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of the Natural History, University of Florida (MCUF), Gainesville, FL, USA. The holotypes of the new species are deposited in MCUF and paratypes are in both museums, on indefinite loan from Taiwan.

Taxonomic accounts

***Caveana senuri* Park, sp. n.**
urn:lsid:zoobank.org:act:BB330AA1-77FD-4D94-B7AE-D02781BAD8A9
http://species-id.net/wiki/Caveana_senuri
Figs 1–12

Diagnosis. The light-orange color pattern of the forewing is unique, with dark-brown streaks between veins. The pattern is more or less similar to that of *Timyra aulonitis* Meyrick, 1908 which was described from Sri Lanka, but the species can be distinguished by the venation of both wings, and by the absence of the scale projection in the basal segment of antenna and the scale-tuft in the hind tibia which are unique to *Timyra* Walker, 1864. The male genitalia are also different from those of the *T. aulonitis*.

Description. Male and female (Figs 1–5, 11): Wingspan, 17–18 mm. Head light orange. Basal segment of antenna (Fig. 5) elongate, light orange, speckled with brownish scales dorsally; flagellum dark brown, sometimes paler from near half to before 7th. Second segment of labial palpus (Fig. 3) gently arched, shiny pale orange; 3rd segment slender, as long as 2nd segment, pale orange speckled with dark-brown scales, with acute apex. Thorax and tegula light orange. Forewing elongate; ground color light orange, clothed with dark-brown scales between veins; costa nearly straight, then gently arched beyond ¾, blackish along anterior margin; apex obtuse; 5-6 large, blackish spots from apex to tornus along termen; termen oblique, not sinuate; fringe light orange in basal 1/3, then dark brown; venation (Fig. 11) with R_1 arising from before middle, R_2 arising near upper corner of cell, R_3 and R_4 stalked near 2/3 length of R_{3+4+5}, R_4 and R_5 stalked about 3/5 length; R_5 reach before apex, M_1 close to R_3 at base, M_2 straightly extended from lower margin of discal cell, M_3 on common stalk with CuA_{1+2}, CuA_1 and CuA_2 stalked beyond middle. Hindwing evenly clothed with dark-brown scales, except on veins; light orange along veins; distinct blackish line well-developed from prior to apex to tornus along margin; venation with Rs and M_1 nearly connate, M_2 absent, M_3 and CuA_1 stalked. Fore and mid tibia with black scales at apex. Hind tibia (Fig. 11) with rough,

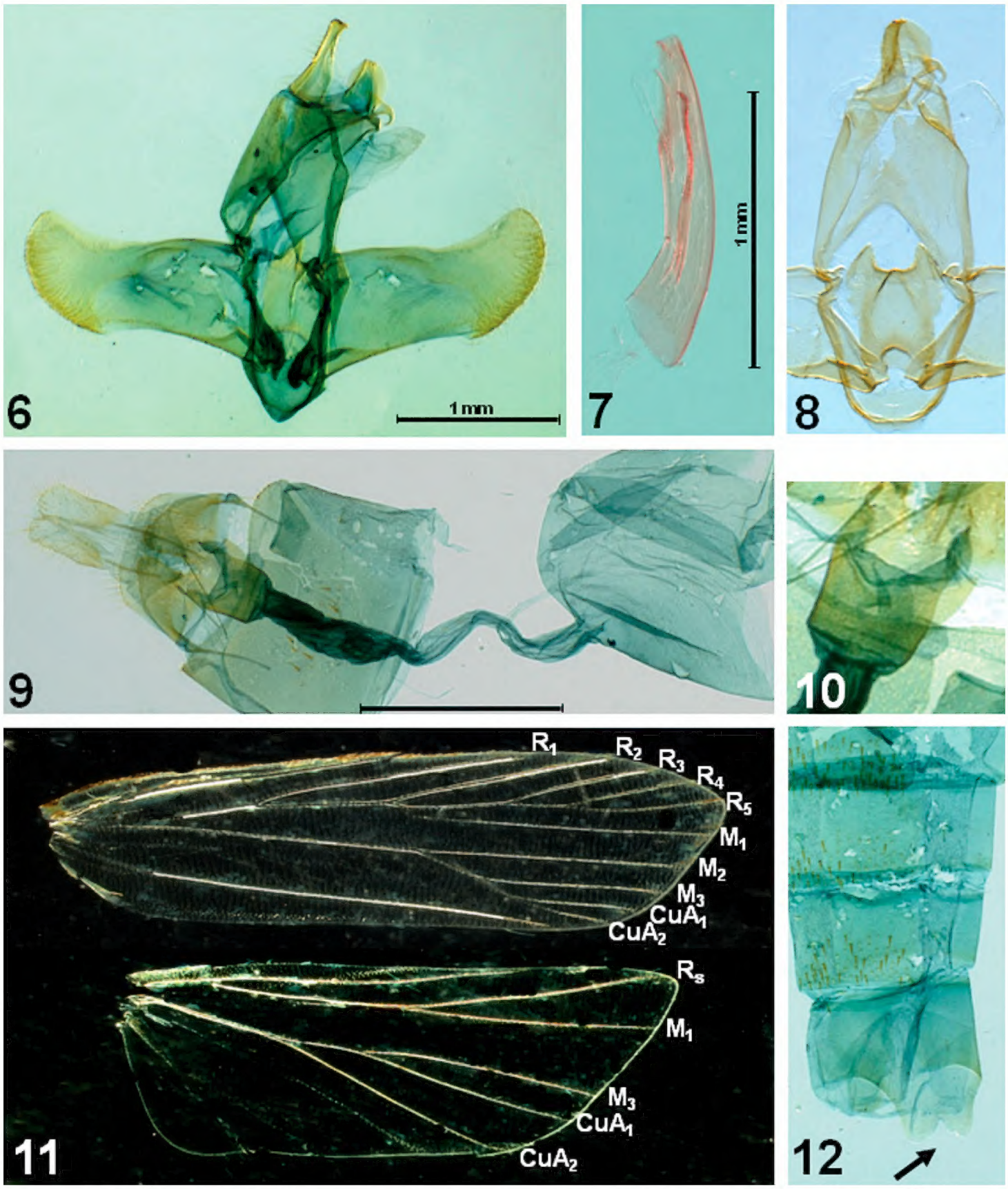


Figures 1–5. Adult of *Caveana senuri* Park, sp. n. **1** adult, paratype **2** ditto, lateral view **3** labial palpus **4** hind tibia **5** basal part of antenna.

dark-brown scales above, denser near apex; tarsi with black scales at apex on each segment. Abdomen clothed with dark-brown scales; abdominal tergites with dense spines; sternite VIII bilobed medially, as indicated in Fig. 12.

Male genitalia (Figs 6–8). Uncus elongate, heavily sclerotized, broadened basally; apex slightly bifurcate. Gnathos relatively short, small, strongly bent downward beyond 2/3. Tegumen long, relatively broad; anterior margin deeply concave. Valva broad; costa slightly concave beyond middle, nearly parallel to ventral margin; cucullus short; outer margin rounded, with dense setae along margin. Juxta shield-shaped, concave in U-shape on caudal margin, with triangular caudal lobes laterally; anterior margin deeply concave. Vinculum narrow, band-shaped. Saccus short, rounded. Aedeagus rather slender, as long as valva, slightly bent; cornutus long, narrow sclerite, as long as 2/3 length of aedeagus. Abdominal tergites with dense spinose zones; sternite VIII bifurcated medially (arrow indicated in Fig. 12).

Female genitalia (Figs 9, 10). Abdominal sternite VIII weakly sclerotized, deeply emarginated on caudal margin medially. Apophyses anteriores less than half length of



Figures 6–12. Genitalia and wing venation of *Caveana senuri* Park, sp. n. **6** male genitalia **7** aedeagus **8** juxta and vinculum **9** female genitalia **10** ditto, close-up of antrum; **11** wing venation **12** abdominal segment (arrow indicates the bilobed sternite VIII). Scale bar: 1 mm.

apophyses posteriores. Antrum (Fig. 10) cup-shaped, weakly sclerotized, about 1/4 length of ductus bursae. Ductus bursae longer than corpus bursae, broadened in distal 2/5 length, then slightly narrowed; ductus seminalis arising from near conjunction with corpus bursae. Corpus bursae large, ovate; signum absent.

Holotype. ♂, Taiwan, Kaohsiung County, Lukuei Forest Station., 750 m, 29 iv-3 v 1989 (J. Heppner & H. Wang), deposited in MCUF.

Paratypes. 1♂, 1♀, same data as the holotype, genitalia slide no. CIS-6138/Park (♂), -6139/Park(♀); 1♀, Taiwan, Nantou Co., Lu-shan, 30 km E Wushe, 1000 m, 27–31 v 1980 (D.R. Davis), gen. slide no. USNM-92404; 1 gen. slide no. CIS-6138/Park; 1♂, Taiwan, Nantou Co., 15 km E of Puli, 700 m, 6 v 1989 (J. Heppner & H. Wang).

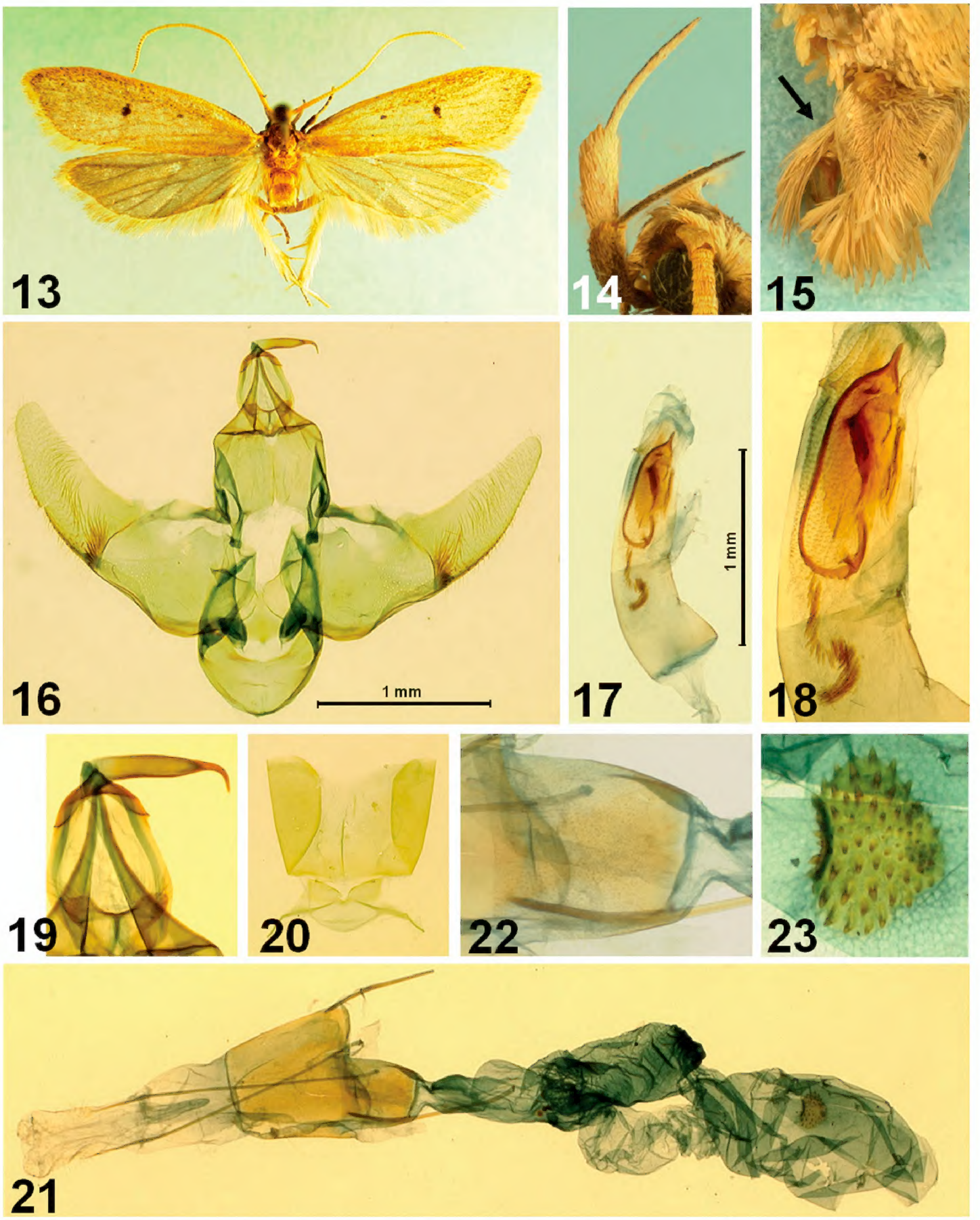
Distribution. Taiwan.

Etymology. The specific epithet is a Korean term, *senuri,* meaning "a new country".

***Lecithocera dondavisi* Park, sp. n.**
urn:lsid:zoobank.org:act:6D63A8D5-E85E-4D8E-9F14-95ED992901E6
http://species-id.net/wiki/Lecithocera_dondavisi
Figs 13–23

Diagnosis. This species is one of the largest species of *Lecithocera*. It is externally similar to *L. praeses* Meyrick, 1919 from North India, but can be distinguished by different following genital features: male genitalia with uniquely specialized cornuti of aedeagus, consisting of a heavily sclerotized ellipticity with an acute spine apically, a heavily sclerotized, elongate trapezoidal plate, and a series of spines, as in Figs 17, 18; and also cucullus with more gently arched ventral margin and juxta not so much produced latero-caudally. Female genitalia with cup-shaped antrum, instead of the elongate, more or less triangular antrum in *L. praeses,* and the signum strawberry-shaped, located medially, whereas it is transverse elongated and located posteriorly in the latter.

Description. Male and female (Figs 13–15). Wingspan, 23–26 mm. Head yellowish brown medially on vertex, with pale grayish-orange erect scales laterally; frons pale grayish-orange. Basal segment of antenna rather short, pale grayish orange; flagellum orange white to pale grayish–orange, with distinct brownish annulations in apical third. Second segment of labial palpus (Fig. 14) thickened with appressed scales, grayish orange on outer surface, speckled with dark-brown scales in basal 2/3, orange white to pale grayish orange on inner surface; 3rd segment slender, shorter than 2nd segment, dark brown on ventral surface, with acute apex. Thorax and tegula yellowish brown. Forewing elongate; ground color pale grayish orange, speckled with fine dark-brown scales, more dense posteriorly; first discal stigma small, dark brown at middle of cell; second stigma larger, dark brown, at end of cell; basal blackish streak running along costa in ¼ length; costa nearly straight, then gently arched beyond ¾; apex obtuse; termen oblique, not sinuate, dark-brown scales along margin; fringe orange white in basal 1/3, then brownish; venation with R_1 arising from before middle, R_2 arising near upper corner of cell, distance between R_1 and R_2 about 2.5 times of distance between R_2 and R_3; R_2 free; R_3 and R_4 stalked near middle; R_5 reach apex; M_1 at middle between R_3 and M_2, M_2 nearly parallel with M_1; M_3 at middle between M_2 and CuA_{1+2}; CuA_1 and CuA_2 very short-stalked. Hindwing pale gray, broader than forewing; apex obtuse; termen oblique, slightly sinuate; fringe grayish, with orange white basal line; venation with, M_2 well developed, connected to M_3 with cross vein; M_3 and CuA_1 short-stalked; cell nearly closed with an oblique cross vein. Hind tibia with orange-white rough scales above. Abdomen with pale



Figures 13–23. *Lecithocera dondavisi* Park, sp. n. **13** adult, paratype **14** labial palpus **15** terminal segments of abdomen (arrow indicates the dorsal scale-tuft) **16** male genitalia **17** aedeagus **18** close-up of cornuti **19** close-up of signum **20** abdominal sternite VIII **21** female genitalia **22** close-up of antrum **23** close-up of signum. Scale bar: 1 mm.

grayish-orange scales dorsally, with a well-developed scales-tuft dorsally in terminal segment, as indicated in Fig. 15; sternite VIII bilobed medially, as indicated in the Fig. 12.

Male genitalia (Figs 16–22). Basal lobes of uncus more or less semiovate, gently concave on caudal margin. Gnathos (Fig. 19) relatively slender; apical part heavily scle-

rotized, strongly bent downward. Tegumen weakly sclerotized with anterior margin incised medially. Valva broad at base, width as wide as length of tegumen; costal bar connecting with tegumen strong, angled medially; ventral margin gently concave before cucullus; cucullus elongate, narrowed towards apex, dense setose, with bundle of setae at lower corner at base, apex rounded; sacculus sclerotized, slender. Juxta shield-shaped, with small projection at middle on anterior margin; caudal margin slightly emarginated, with crescent extension laterally. Vinculum broad, with round apex. Saccus round. Aedeagus (Figs 17, 18) with uniquely specialized cornuti of aedeagus, consisting as heavily sclerotized ellipticity with acute spine at apex, about half length of aedeagus, and a row of short spines. Abdominal tergites without spines; sternite VII-VIII as figured in Fig. 20.

Female genitalia (Figs 21–23). Abdominal sternite VIII weakly sclerotized, nearly straight anterior margin. Apophyses anteriores thick, short, nearly 1/5 length of apophyses posteriors. Antrum (Fig. 22) cup-shaped, weakly sclerotized, about 2/3 length of abdominal sternite VIII. Ductus bursae slightly longer than corpus bursae, shortly necked between antrum and ductus bursae, then broadened; ductus seminalis as broad as ductus bursae, arising from middle. Corpus bursae large, elongate; signum strawberry-shaped, with dense conic spines.

Holotype. ♂, Taiwan, Hsinchu County., Kuangwu, 24-25 vi 1985 (J. Heppner & H. Wang), gen. slide no. CIS-6168/Park, deposited in MCUF.

Paratypes. 4 ♂, 1♀, same data as the holotype, gen. slide no. CIS- 6192/Park(♀); 1♂, Taiwan, Nantou Co., Meifeng 30 km S Tayuling 2200 m, 1-8 vi 1980 (D. R. Davis), gen. slide no. USNM-92499/Park.

Distribution. Taiwan.

Etymology. The species is named after Dr. Donald R. Davis, Curator of Lepidoptera, US National Museum Natural History, Smithsonian Institution, USA, an authority on the microlepidoptera of the world.

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